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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/811,386	03/29/2004	Kazuhisa Yokoyama	Q80760	3078
23373	7590	08/08/2006	EXAMINER	
SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037			LEYSON, JOSEPH S	
			ART UNIT	PAPER NUMBER
			1722	

DATE MAILED: 08/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/811,386	<b>Applicant(s)</b> YOKOYAMA ET AL.	
	<b>Examiner</b> Joseph Leyson	<b>Art Unit</b> 1722	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 05 July 2006.  
 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-3 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
 6) ☒ Claim(s) 1-3 is/are rejected.  
 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
 10) ☒ The drawing(s) filed on 05 July 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) ☒ All b) ☐ Some \* c) ☐ None of:  
 1. ☒ Certified copies of the priority documents have been received.  
 2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
 \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input checked="" type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Drawings*

1. The new sheet of drawings was received on July 5, 2006. The new sheet is accepted.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).
4. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese reference (6-246802) in view of Uehara et al. (U.S. Patent 6,228,308).

Japanese reference (6-246802) discloses an inline screw plasticizing injection apparatus which plasticizes and injects a thermoplastic resin pellet including long glass fibers having a length substantially the same as a length of the pellet and aligned in a

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longitudinal direction of the pellet (for example, see paragraph number 006), the injection apparatus comprising a screw 14 having a diameter (D) of 100 mm (for example, see table 1), a hollow heating cylinder 12 in which the screw 14 is provided, a screw head 20 coupled to the screw 14 through a shaft 24, a weir plate 22 fixed at a rear end of the shaft 24, and a check ring 26 slidably fitted around the shaft 24 so as to be capable of reciprocating between the screw head 20 and the weir plate 22 in a space defined by the shaft 24 and the heating cylinder 12 so that a molten resin path is formed by the heating cylinder 12, the screw head 20, the shaft 24, the check ring 26 and the weir plate 22. Japanese reference (6-246802: for example, see paragraph 0015) also discloses that conventional plasticization injection equipment have a width in a direction orthogonal to a flow direction of the molten resin in the molten resin path formed by the weir plate 22 and the check ring 26 that is set to 3 through 6% of the diameter (D) of the screw 14. An angle of  $\theta$  between end faces of the weir plate 22 and the check ring 26 and a vertical axis is desired to be 30 through 40° (see paragraph 0017).

However, Japanese reference (6-246802) does not disclose a ratio of a length (L) / a diameter (D) in the screw being set to 18 through 24, a length (Lf) of a supplying portion of the screw being set to 10 through 14 times the diameter (D), a groove depth (hf) of the supplying portion of the screw being set to be not less than 13 mm, or a groove depth (hm) of a measuring portion of the screw being set to be not less than 8 mm.

Uehara et al. (U.S. Patent 6,228,308) disclose an inline screw plasticizing injection apparatus which plasticizes and injects a thermoplastic resin pellet including

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long glass fibers having a length substantially the same as a length of the pellet and aligned in a longitudinal direction of the pellet (for example, see col. 1, lines 7-21; col. 9, lines 2-4; 18-25), the injection apparatus comprising a screw 1, a hollow heating cylinder 4, 5 in which the screw 1 is provided, a screw head 3 coupled to the screw 1 through a shaft (see fig. 4), and a check ring 2 slidably fitted around the shaft so as to be capable of reciprocating along the shaft so that a molten resin path is formed by the heating cylinder 4, 5, the screw head 3, the shaft, the check ring 2 and the screw 1. Uehara et al. (U.S. Patent 6,228,308) disclose further characteristics as follows. A ratio of a length (L) / a diameter (D) in the screw 1 is set to 15 through 25 (i.e., col. 2, lines 13-22; col. 10, lines 44-48). A feed or supplying portion length (Sf), a compression portion length (Sc) and a metering portion length (Sm) are generally of the ratio of the length of the screw in the range of from 2:1:1 to 3:2:1 (i.e., figs. 1-3; col. 2, lines 13-22). Note that if L/D is 24, then  $L=24D$ ; and if  $L=24D$  and if Sf:Sc:Sm is 3:2:1, then Sf:Sc:Sm=12D:8D:4D, such that the length (Sf) of the supplying portion of the screw 1 is set to 12 times the diameter (D). A groove depth (Hf) of the supplying portion (Sf) is in the range of 0.13D to 0.18D, and the groove depth (Hm) of the metering portion (Sm) is in the range of 0.03D to 0.08D (i.e., col. 2, lines 28-40). Note that if D=100mm (as taught by Japanese reference (6-246802) as mentioned above) and if Hf=0.18D and if Hm=0.08D, then the groove depth (Hf) of the supplying portion of the screw is 18 mm, and the groove depth (Hm) of a measuring portion of the screw is 8 mm.

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to modify the apparatus of Japanese reference (6-246802) with the

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further characteristics as mentioned above of the apparatus of Uehara et al. (U.S. Patent 6,228,308) with a reasonable expectation of success because Uehara et al. (U.S. Patent 6,228,308: i.e., cols. 1-2) disclose that such characteristics are conventional in the art and would provide working dimensions and/or dimensional relationships for an inline screw plasticizing injection apparatus. As to the limitations of the angle of  $\theta$  and of the check ring width, as recited by the instant claims, such limitations relate to the desired dimensions of the claimed apparatus. It would have been further obvious to an artisan of ordinary skill to modify the angle of  $\theta$  between end faces of the weir plate and the check ring and a horizontal axis to be set to  $70^\circ$  through  $90^\circ$  or to modify a width of the check ring to be set to 0.3 through 0.4 times the diameter (D) of the screw because such a modification would have been found due to routine experimentation/engineering in finding operable or optimum dimensions for the apparatus and/or would still enable the check ring to function as a valve as before. In Gardner v. TEC Systems, Inc., 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984), the Federal Circuit held that, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device. It is not inventive to discover optimum or workable ranges by routine experimentation, In re Aller, 105 USPQ 233.

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese reference (6-246802) in view of Uehara et al. (U.S. Patent 6,228,308) as applied to claims 1 and 2 above, and further in view of Taniguchi (U.S. Patent 5,002,717).

Taniguchi (U.S. Patent 5,002,717) discloses an inline screw plasticizing injection apparatus including a check ring 5 having a front side provided with projections 5b which are fitted to notches 4d of a screw head 4 of a screw 2 so that the screw head 4 and the check ring 5 rotate together when the screw 2 is rotated (i.e., col. 5, lines 28-44; figs. 3(a)-4(c) ).

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to further modify the apparatus such that a projection is provided on a front side of the check ring which is fitted to a notch provided on the screw head because such a modification is conventional in the art and would enable the screw head and the check ring to rotate together when the screw is rotated, as disclosed by Taniguchi (U.S. Patent 5,002,717).

#### ***Response to Arguments***

6. Applicant's arguments filed July 5, 2006 have been fully considered but they are not persuasive.

Applicants argue that Japanese reference (6-246802) fails to disclose a specified width of the check ring and that width of the check ring is not simply a design choice, but is integral to the working of the claimed invention, as noted in the instant specification which discloses that a width smaller than 0.3 times the screw diameter

would not function as a seal and anything larger than 0.4 times the screw diameter would interfere with the screw.

The examiner agrees that Japanese reference (6-246802) fails to disclose a specified width of the check ring. However, it should be noted that the check ring of Japanese reference (6-246802) functions the same as applicant's check ring, i.e., the check ring seals to prevent backflow. It is inherent that the check ring is dimensioned to be able to seal and to not interfere with the screw, or else the check ring would not be operable. The examiner agrees that the width of the check ring is not simply a design choice, as widths smaller than 0.3 times the screw diameter and widths larger than 0.4 times the screw diameter would produce an inoperable check ring, as disclosed by applicants. However, it would be well within an artisan of ordinary skill in view of the prior art above to find operable or optimum dimensions for the apparatus of Japanese reference (6-246802) by routine experimentation/engineering, as long as the prior art apparatus functions as disclosed. It is not inventive to discover optimum or workable ranges by routine experimentation, In re Aller, 105 USPQ 233. Where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device, Gardner v. TEC Systems, Inc., 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984).

***Conclusion***



7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Leyson whose telephone number is (571) 272-5061. The examiner can normally be reached on M-F 9AM-5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gupta Yogendra can be reached on (571) 272-1316. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

*q*

JL

  
ROBERT DAVIS  
PRIMARY EXAMINER  
GROUP 1300-1700

8/7/00